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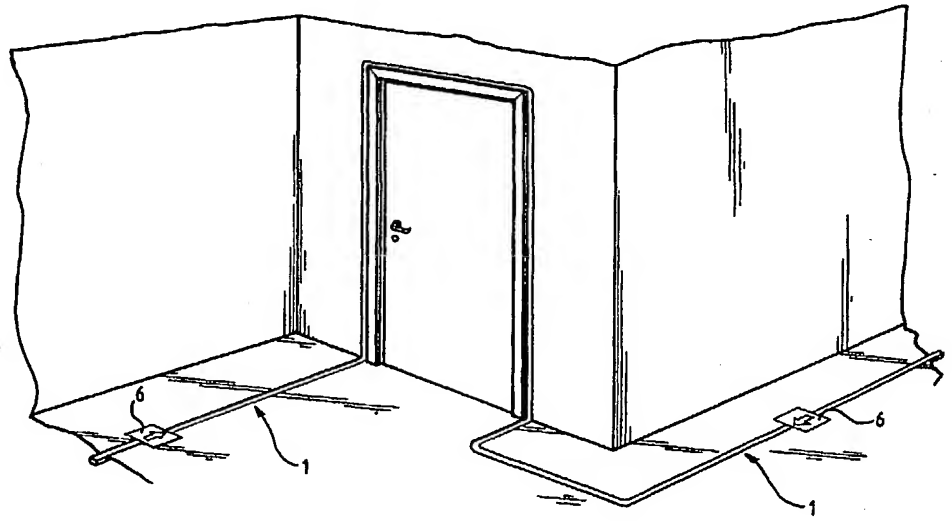

(57) Abstract

A guide light system for safety purposes is characterised in that said guide light system comprises an electroluminescent wire (2) of the type which shines when an electric voltage is applied to an end of the wire (2) which is arranged in a holding member (3) to be mounted in a suitable position and a voltage source for supplying the electroluminescent wire (2).

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GUIDE LIGHT SYSTEM

Field of the Invention

The present invention relates to a guide light system for safety purposes.

Technical Background

Today there are a number of ways to mark emergency exits and the like in the event of fire or other situations where it is necessary to quickly evacuate, for instance, a building.

Emergency exits are usually marked by electrically illuminated signs, which are arranged close to the ceiling. However, in case of fire, these signs have the disadvantage of being rapidly hidden by smoke and the like moving upwards to stay just under the ceiling. The situation is deteriorated by the fact that those who are looking for a way out usually have to crouch down to get away from the smoke.

Another known system, which is generally used to mark steps, consists of a number of electric light-emitting diodes which are arranged in a row at the edge of each step. However, they suffer from the disadvantage of each row having to be provided with a current supply of its own and of a wire breakdown easily occurring since the diodes are relatively poorly protected against strains from outside. Such a breakdown may be particularly serious if water or oil of some kind is spread in connection with an accident, since it may become charged owing to the wire breakdown.

There are also a plurality of cords or hawsers for various safety purposes. One example is the cords used by firemen or smoke-helmeted firemen when getting into a burning or smoke-filled building. One of the ends of the cord is hitched to the fireman who drags it along (à la

Ariadne) while walking through the building. If the fireman gets into difficulties, the cord will serve as a lead so that the rescuing crew can find him quickly.

A disadvantage of such cords is that they are difficult to discover, for instance, in a room filled with smoke, where visibility is greatly limited.

Consequently, there is a need for a safer and better guide light system.

Summary of the Invention

This object is achieved by a guide light system that comprises an electroluminescent wire of the type which shines when an electric voltage is applied to an end of the wire which is arranged in a holding means to be mounted in a suitable position and a voltage source for supplying the electroluminescent wire.

Electroluminescent wires are commercially available, emitting a relatively strong light over their whole length when voltage is applied to their end. One example of such a wire is marketed under the name of LUMiLIGHT by L.E.O.N. GmbH, Berlin.

A guide light system as described above can be arranged in a low position, for instance in floors or along walls. Since the required voltage is applied to one end of the wire, many embodiments of the system are possible by means of one single voltage source. This voltage supply and the structure of the wire further allow the wire to be arranged so that it is not damaged by water or oil that is being spilt on the floor. Thus, there is no risk that the water or the oil gets charged as a consequence of a breakdown in the guide light system. The arrangement in a low position is the most advantageous one in connection with, for instance, fire, even though the system may also be arranged on, for example, walls or round a doorway.

Conveniently, the holding means can be arranged in a smooth surface, especially a floor surface, and the hold-

ing means is then preferably defined in the same plane as the surface. This results in a smooth surface provided with guide light. The wire is then suitably laid in a groove formed in the surface, and the holding means consists of a transparent plastic material arranged over the wire. Preferably, the wire is then arranged in such a manner that first the groove is formed by milling in the surface and the wire is laid in the groove. Finally, the plastic material is melted over the wire, and after the plastic material has solidified, surplus material, if any, may be ground off so as to obtain a smooth surface.

The holding means may also consist of a section that is arranged along an edge, preferably a door or window frame, the wire being laid in the section. Such an arrangement of the wire is particularly suitable to make the emergency exits highly visible.

A portion of an area which is illuminated by the wire may advantageously be masked to form a marking. This marking may serve as an information carrier and, for instance, be an arrow that is directed towards an exit. It may also form, for example, characters.

The voltage source is conveniently connected to an alarm signal in such a manner that voltage is applied to the wire when the alarm is set off. Thus, the guide light system will be activated when, for instance, a fire alarm sets off.

The voltage source may, for instance, consist of an accumulator, such as a battery. Advantageously, the voltage source may also be arranged so as to be automatically switched on in case of power failure. When a room is blacked out because of power failure, the guide light system will be activated automatically.

The voltage source may be arranged to provide a modulated signal, which results in the wire emitting light similar to a wave along the wire, or the voltage source may generate pulses, the wire emitting flashing

light. Both effects may contribute to the guide light system being noticed more easily and more quickly.

According to a second aspect of the invention, the holding means may consist of a cord, an electroluminescent wire of the above-mentioned type being laid in the cord. Thus, a cord is obtained that is strong, durable and at the same time highly visible, even when the visibility is greatly limited.

The invention according to the last-mentioned aspect is particularly useful in applications where it is only possible to connect one end of the cord to an electric socket, for instance as used by firemen and divers.

However, the invention is also useful, for example, for banister rails or balcony rails in order to provide strong rails, which are highly visible also in the dark.

One end of the wire is preferably connected to a voltage source for generating the voltage required to make the wire shine.

Brief Description of the Drawings

Fig. 1 shows an embodiment according to the invention, which is arranged in a room.

Fig. 2 is a cross-section of an embodiment according to the invention, which is arranged in a groove in a floor surface.

Fig. 3 is a cross-section of an embodiment of the invention, which is arranged with the aid of a holding means provided with barbs.

Fig. 4 is a side view of an embodiment according to a second aspect of the invention.

Fig. 5 is a side view of the embodiment in Fig. 4.

Description of Preferred Embodiments

Fig. 1 shows by way of example a preferred embodiment of the invention being arranged in a room. The aim of the guide light system is to show the way to an emergency exit such as a door. In the floor of the room, a groove is formed by milling, and a wire of the type that emits light when voltage is applied to one of its ends is laid in the groove. Over the wire, a transparent plastic layer is arranged, that serves the double aim of holding and protecting the wire. Fig. 2 is a cross-section of the wire arranged in the groove. A portion of the wire is masked at two locations to form a marking such as an arrow that is directed towards the exit. At the exit the wire leaves the groove in the floor surface and is in its extension arranged in a holding section along the door frame. The whole door is thus made visible. This guide light system is highly visible, even though the room is filled with, for instance, smoke. Moreover, it withstands external strains such as when exposed to water and oil.

An embodiment of a second aspect of the invention is shown in Figs 4 and 5. Here a cord 1 is shown, in which an electroluminescent wire is laid. The cord is arranged in a portable take-up element 2. The take-up element 2 comprises a rotatable roller 3 onto which the cord 1 is rolled. The roller 3 is supported by a supporting frame 4 and is rotatable on a spindle 5 of the supporting frame 4.

On an end wall of the roller 3, an electric lead-in 6 is arranged for connection to a voltage source, preferably to the electric mains. Behind the electric lead-in 6, there is arranged a converter which converts the voltage and the current into the magnitudes required for the electroluminescent wire. The converted voltage is conducted to that end of the electroluminescent wire in the cord 1 which is arranged closest to the roller 3, so that the cord 1 shines when a voltage source is connected to the electric lead-in 6.

Preferably, also a chargeable battery is arranged behind the electric lead-in 6. This battery supplies voltage to the wire when the device is not connected to an external voltage source. The battery may then suitably be arranged so as to be charged while an external voltage source is connected to the electric lead-in 6. This results in a device which may be used under various circumstances, whether connection to mains voltage is possible or not.

On the end wall of the roller, also a switch button 7 is arranged. The button controls an electric switch which is arranged adjacent to the voltage source for switching between various operating positions. Such operating positions may conveniently be an operating position with continuous supply of voltage for fixed light from the wire, an operating position with pulsating supply of voltage for flashing light and a passive operating position where the voltage is disconnected and the wire is without light.

The above-mentioned electric devices may advantageously be included in the interior of the roller 3. The centre portion of the roller 3 is then suitably formed like a drum, in which the electric parts are arranged. The end portion of the drum is conveniently covered with a lid 15 that is movable for maintenance of the electronics.

Besides, the end wall of the roller 3 is at its outer edge provided with a crank handle 12 for winding the cord 1 onto the roller 3.

The supporting frame 4 comprises a handle portion 8 and two parallel base portions 9. The base portions 9 are each provided with two sleeves 10 of an electrically insulating material, preferably rubber. The sleeves 10 abut against the ground so that the supporting frame 4 is electrically insulated therefrom. Similarly, the handle portion 8 is provided with an insulating sleeve 11 so

that when moving the supporting frame 4, there is no risk of getting any electric shocks.

A stopping element 13 is arranged in the supporting frame 4 and engages, in a stopping position, the end wall of the roller 3 facing the supporting frame 4, thereby locking the roller 3, for instance in connection with transport. The stopping element 13 may suitably consist of a threaded stop screw.

At the free end of the cord 1, a hook element 14 is arranged for attaching the cord 1, for instance, to a human being.

The guide light system according to the invention may be connected to existing electric systems and has, in such an embodiment, no limitations regarding the length of the wire. When connected to an accumulator, there is normally a limitation of the maximum length of the wire, for example 250 m.

There are, of course, many other embodiments of the invention than those shown. The guide light system may be used in staircases and the like, and advantageously, several wires can be arranged in a larger room, all leading to the same or to the nearest exit. In soft carpets, the wire is conveniently arranged with the aid of a transparent holding means, which may be provided with upwardly directed barbs for keeping the wire and the holding means in position in the carpet as shown in Fig. 3.

If the electroluminescent wire is arranged in a cord 1 which is used, for instance, to enclose an area, the portable take-up element 2 is, of course, not necessary. The electroluminescent wire may be laid in the cord 1 in different ways by, for example, braiding or interlacing.

The cord 1 may also be enclosed in a casing of some translucent material, for instance plastic material, in order to increase its resistance to wear and heat. In this case, the electroluminescent wire may be laid beside the cord material and they are kept together only with the aid of the casing. The electric voltage lead-in 6,

the switch button 7 and the electronic devices may then be fixedly arranged in connection with the cord, for instance, in a wall, a post or a separate box.

The invention may also be used in loose objects that for some reason need to be made visible, for instance, life buoys, life belts or ladders.

Switching does not have to be possible between three different operating positions, but if desired, there can be more or fewer positions.

The holding means may, apart from comprising a pin, a cord or a moulding compound, such as mentioned in the description, comprise any other form of a fixing device.

CLAIMS

1. A guide light system for safety purposes, c h a r a c t e r i s e d in that said guide light system (1) comprises an electroluminescent wire (2) of the type which shines when an electric voltage is applied to an end of the wire which is arranged in a holding means (3) to be mounted in a suitable position and a voltage source for supplying the electroluminescent wire.

2. A guide light system as claimed in claim 1, wherein the holding means (3) is arranged in a smooth surface, especially a floor surface (4), and the holding means (3) is defined in the same plane as the surface.

3. A guide light system as claimed in claim 2, wherein the wire (2) is laid in a groove (5) extending in the surface, and the holding means (3) consists of a transparent plastic material arranged over the wire (2).

4. A guide light system as claimed in claim 1, wherein the holding means (3) consists of a section that is arranged along an edge, preferably a door or window frame, and the wire (2) is laid in this section (3).

5. A guide light system as claimed in any one of claims 1-4, wherein a portion of an area illuminated by the wire (2) is masked with the aid of a marking means (6) to form a marking.

6. A guide light system as claimed in any one of claims 1-5, wherein the voltage source is connected to an alarm signal in such a manner that voltage is applied to the wire (2) when the alarm is set off.

7. A guide light system as claimed in any one of claims 1-6, wherein the voltage source consists of an accumulator.

8. A guide light system as claimed in claim 7, wherein the voltage source is arranged so that it is automatically switched on in case of power failure.

9. A guide light system as claimed in any one of claims 1-8, wherein the voltage source supplies a modulated signal so that the wire emits light similar to a wave along the wire (2).

10. A guide light system as claimed in any one of claims 1-8, wherein the voltage source supplies pulses so that the wire (2) emits flashing light.

11. A guide light system as claimed in claim 1, wherein the electroluminescent wire which is of the type that shines when electric voltage is applied to the end of the wire is laid in a cord (1).

12. A guide light system as claimed in claim 11, wherein the end of the wire is connected to a voltage source.

13. A guide light system as claimed in claim 12, wherein the voltage source consists of a battery.

14. A guide light system as claimed in claim 12 or 13, wherein a switch is arranged adjacent to the voltage source for switching between various operating positions.

15. A guide light system as claimed in claim 13 or 14, wherein the cord is arranged in a portable take-up element (2).

16. A guide light system as claimed in claim 15, wherein the take-up element (2) comprises a roller (3) for rolling up the cord (1).

17. A guide light system as claimed in claim 15 or 16, wherein the end of the cord (1) is arranged adjacent to a portion of the take-up element (2) connected to a voltage source.

18. A guide light system as claimed in any one of claims 15-17, wherein the take-up element (2) comprises a supporting frame (4).

19. A guide light system as claimed in claim 18, wherein the portion (10) of the supporting frame (4) abutting against the base consists of an electrically insulating material.

20. A guide light system as claimed in any one of claims 11-19, wherein one end of the cord (1) is provided with a hook means (14).

21. A guide light system as claimed in any one of claims 11-20, wherein the cord (1) is enclosed by a translucent casing.

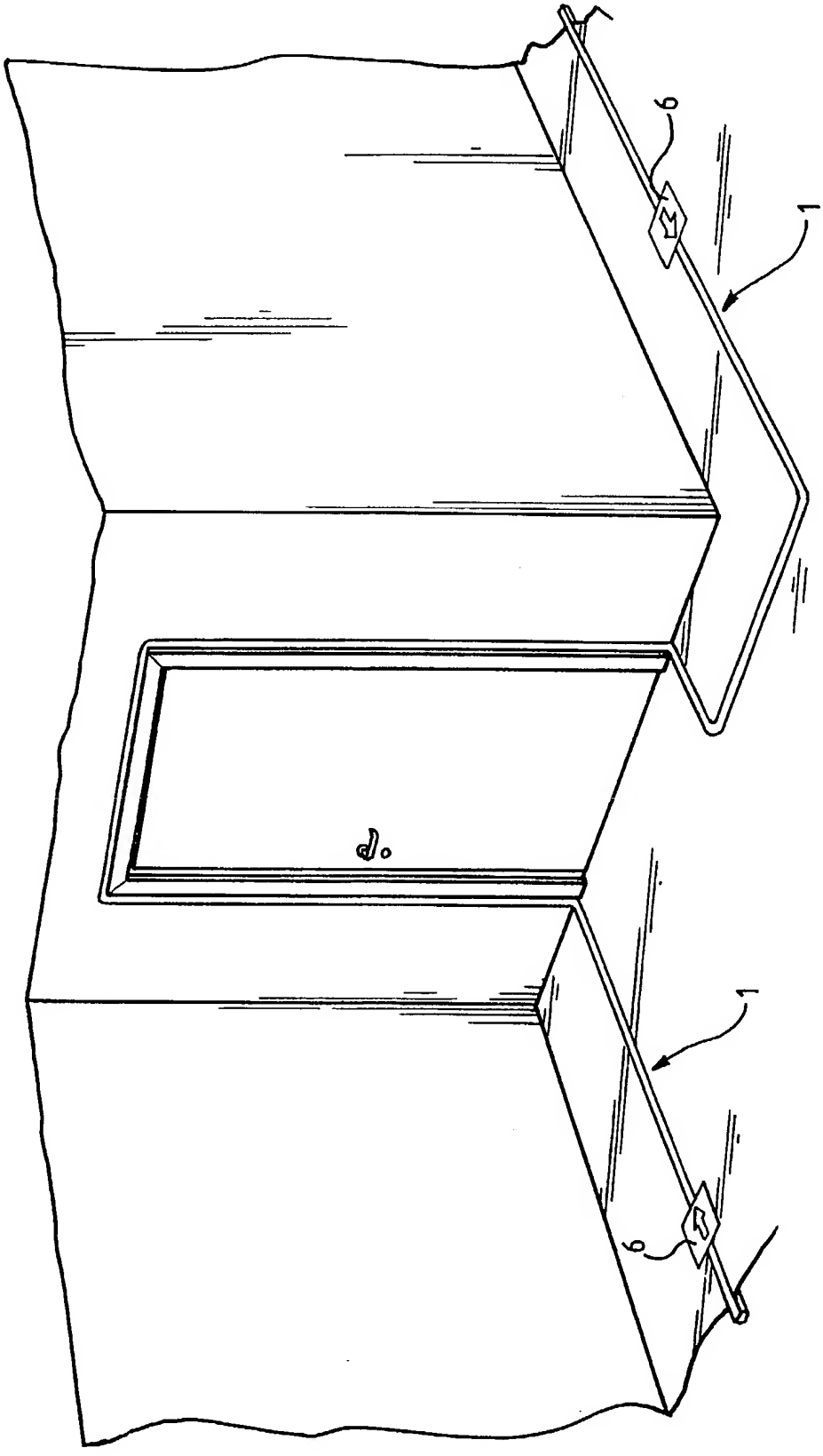

Fig. 1

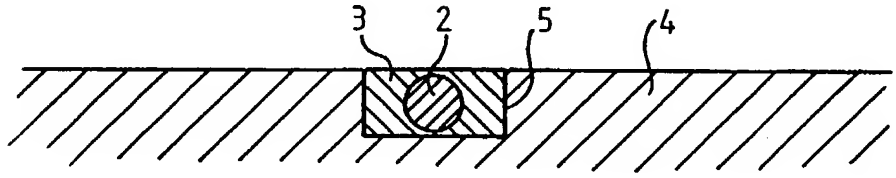

Fig. 2

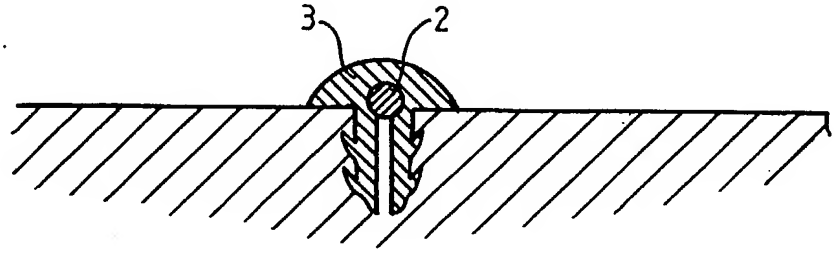

Fig. 3

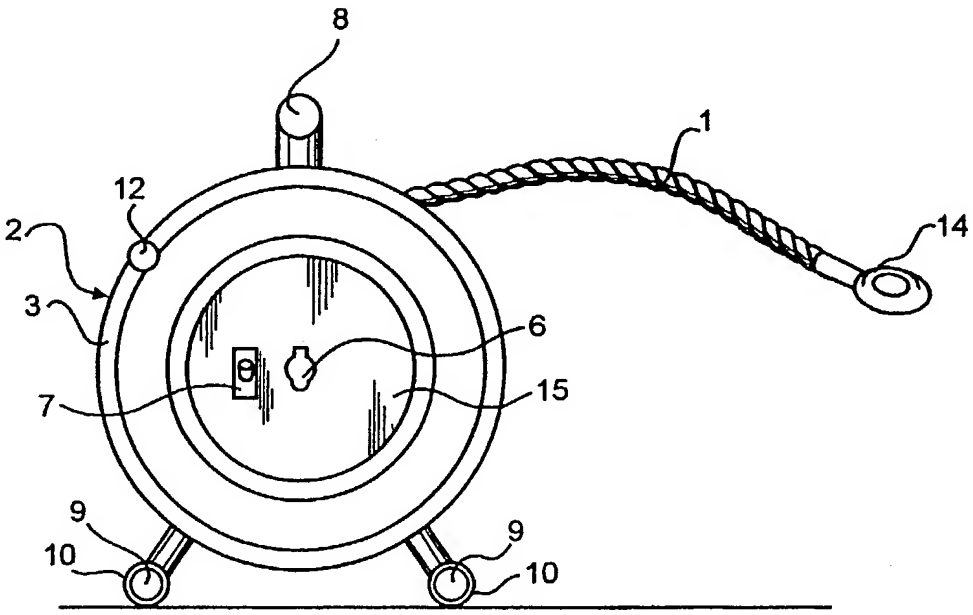

Fig. 4

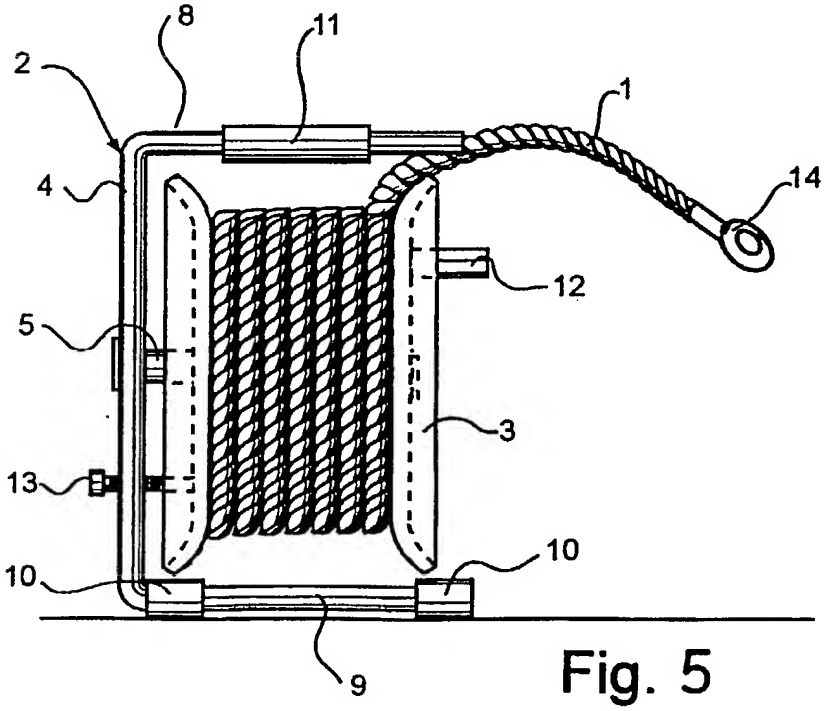

Fig. 5

INTERNATIONAL SEARCH REPORT

International application No.
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A. CLASSIFICATION OF SUBJECT MATTER

IPC7: A62B 3/00, D07B 1/14, G08B 5/00 // B64D 25/00
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